

### Claims

1. A sulfur scrubber assembly for removing sulfur from a gasoline or diesel fuel stream so as to reduce the concentration of sulfur in the fuel stream to less than about 0.05 ppm, said assembly comprising:
  - a) a support structure; and
  - b) a nickel reactant deposited on said support structure, said nickel reactant being operative to react with sulfur in the fuel stream so as to remove sulfur from the fuel stream and form nickel sulfide deposits on the support structure, said nickel reactant having surface area which is greater than about fifty square meters per gram of nickel reactant.
2. The assembly of Claim 1 wherein said nickel reactant is the result of reducing a nickel oxide coating deposited on said support structure.
3. The assembly of Claim 2 wherein the nickel oxide coating is produced by co-precipitation of finely divided nickel and a non-reducible oxide.
4. The assembly of Claim 3 wherein the non-reducible oxide is alumina.
5. The assembly of Claim 3 wherein the non-reducible oxide is an oxide selected from the group consisting of silica, alumina, and rare earth oxides.
6. The assembly of Claim 1 wherein said support structure is a pellet bed.
7. The assembly of Claim 1 wherein said support structure is a porous foam body.
8. The assembly of Claim 1 wherein said support structure is an extruded ceramic monolith.
9. A sulfur scrubber assembly for removing sulfur from a gasoline or diesel fuel stream so as to reduce the concentration of sulfur in the fuel stream to less than about 0.05 ppm, said assembly including an extruded nickel reactant having a surface area which is greater than about fifty square meters per gram of nickel reactant.
10. The assembly of Claim 9 wherein said nickel reactant is the result of reducing a nickel oxide precursor.

11. A method for producing a sulfur scrubbing assembly that is operative to remove sulfur from a gasoline or diesel fuel stream, said method comprising the steps of:

- a) providing a support structure for the assembly;
- b) providing said support structure with a coating that includes nickel oxide and that has a surface area of greater than about fifty square meters per gram of said coating; and
- c) reducing said nickel oxide in said coating to nickel.

12. The method of Claim 11 wherein said support structure is porous.

13. The method of Claim 12 wherein said porous support structure is a foam.

14. The method of Claim 12 wherein said porous support structure is an extruded ceramic monolith.

15. The method of Claim 11 wherein said coating is a co-precipitated mixture of nickel and one or more high surface area non-reducible oxide.

16. A method for removing sulfur from a gasoline or diesel fuel stream, said method comprising the steps of:

- a) providing a sulfur scrubber assembly having a nickel reactant layer with a surface area that is greater than about fifty square meters per gram of reactant; and
- b) passing said fuel stream through said scrubber assembly in a manner which will enable the nickel reactant to react with sulfur in the fuel stream and reduce the concentration of sulfur in the fuel stream to less than about 0.05 ppm.